ABSTRACT

Evaluation and accuracy of three different apex locators in working length estimation of vital first mandibular molars – An invivo study.

AIM:

The aim of this invivo study is to evaluate the accuracy of three different apex locators in identifying the apical constriction in vital mandibular first molars.

METHODOLOGY:

Sixty vital first mandibular molars (irreversible pulpitis) were chosen for this study. Electric Pulp Testing (EPT) and cold testing (EndoFrost) is done to check the tooth vitality with conclusive evidence of vitality being recorded as bleeding while access cavity opening. Pre-operative periapical radiograph was taken to check for the canal patency and root morphology with relatively straight canals. Preoperative intraoral periapical radiographs (IOPA) were taken using a paralleling device to measure a tentative working length which is then transferred to the 15-K-size file (fixed using flowable composite). Later the 15-K-size file is placed in the canals connected with the three different apex locators before and after biomechanical preparation with the file being placed in the canals at apex (0.0 mm) and then at the designated apical constriction mark (0.5mm short of the apex) for all the three canals (mesiobuccal, mesiolingual and distal) seperately. Working length measurements were made using digital calliper. Accuracy in constriction is assessed with PSP (DURR dental) radiography.So from each tooth 18 apex locator readings were recorded, for 60 patients' 1080 readings were obtained.The procedure is single-blinded for unbiased

evaluation and is done using single operator with joined consensus whenever a contradiction in operator evaluation

RESULTS:

Differences among readings from apex locators and radiographic readings were assessed using the paired t- test and repeated measures ANOVA test. Only in two patients (1 male and 1 female) was "APEX" mark readings different from the radiograph estimation. When "0.5" mark readings EALs were compared with each other it was seen that, the readings from Root ZX differed significantly ($P < 0.05$).

CONCLUSIONS:

This study observes the negligible differences in readings between the EALs at "APEX" mark readings and coinciding with radiographic observation. Clinically therefore this report recommends the apical foramen be located with apex locators "APEX" mark reading prior to identifying the apical constriction position.

Keywords: Apex locator, apical foramen, apical constriction, working length, mandibular first molar.